Executive Summary

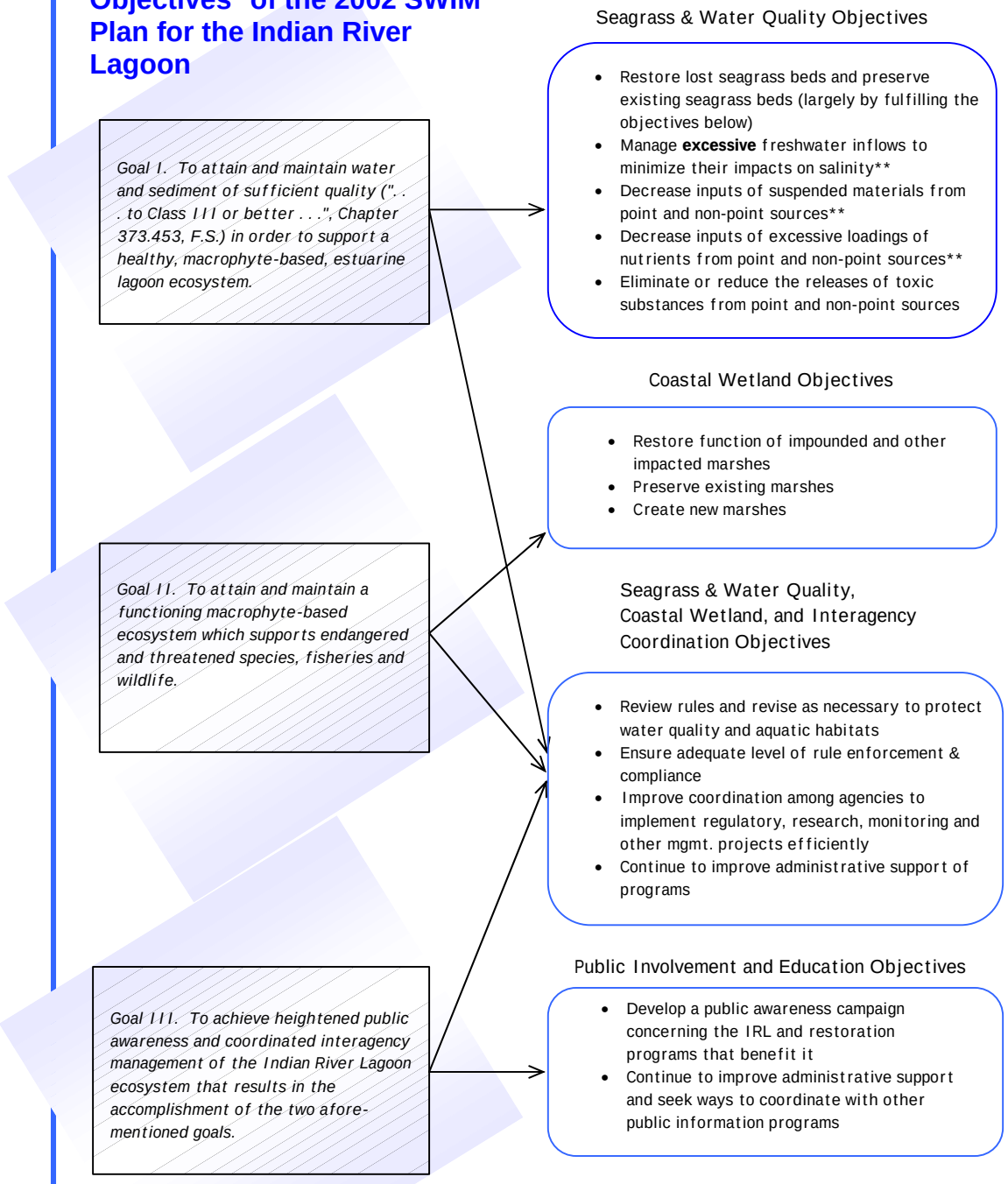
This 2002 update is the second update of the Indian River Lagoon SWIM Plan which was first adopted by the state in 1989 in compliance with the 1987 SWIM Act (Chapter 373.451-373.4595, F.S.). Considerable progress has been made since the last plan update, which was completed in 1994; but there is still much more work that should be done. This update documents the accomplishments, the current problems, and lays out a plan for future work. This update is also timely; prepared at a time when the Indian River Lagoon (IRL) restoration program, in general, is entering into an unprecedented era of major funding partnerships, both local and federal. These partnership programs are aimed at acquiring environmentally strategic lands for preservation or restoration purposes and implementing large-scale construction projects with specific water quality, seagrass, emergent wetland, or other resource targets in mind.

This 2002 plan update includes a status report on the state of the Lagoon, a summary of progress on projects undertaken since the last update, and recommendations for future projects and other actions over the next 5 years (including the major partnership programs mentioned above). This plan update received reviews by the general public and by state, federal, and local agencies, many of which have been active partners with the St. Johns River and South Florida Water Management Districts in conducting the plan's programs since 1989.

The reader, when casting a comparative glance between this update and previous plan documents, will immediately notice a major change in format. Previous IRL SWIM plans were organized by program; each program serving as a major chapter or section heading: Water and Sediment Quality; Habitat Preservation and Restoration, etc. This document, however, is organized by geographic region, beginning with a chapter offering a *Lagoon-wide Overview* (Chapter 2), followed by chapters on the major sub-lagoon watersheds: *Mosquito Lagoon* (Chapter 3)*, Banana River Lagoon* (Chapter 4)*, North and Central IRL* (Chapter 5)*, South IRL* (Chapter 6)*, and St. Lucie River* (Chapter 7). Then, within each chapter, the descriptions of resource status, issues, project objectives and progress, and planned activities are covered under the three major programs: *Seagrass & Water Quality, Coastal Wetlands, and Public Involvement and Education*. The 2002 IRL SWIM Plan update is designed so that a reader with an interest in a specific sub-lagoon area can locate most of its information within a single chapter. Hopefully, by this format change, the reader will find this plan update more informative and interesting.

The three programs, *Seagrass & Water Quality, Coastal Wetlands, and Public Involvement and Education*, address the three IRL SWIM goals, which have remained unchanged since they were first established for the development of the 1989 IRL SWIM Plan. These three goals and their corresponding objectives are presented on the next page (Figure A).

Figure A. Goals and Objectives* of the 2002 SWIM Plan for the Indian River Lagoon



*The set of objectives above are slightly different from those in the 1994 IRL SWIM Plan. Please read Chapter 1, p. 1-3 for an explanation of changes.

** Objective served by development of and compliance with Pollutant Load Reduction Goals (PLRGs), which would be considered in the development of federal and state Total Maximum Daily Loads (TMDLs).

Another program specific to the St. Lucie River generally complies with the three aforementioned goals, but has additional objectives related to the recovery of oyster habitat in the lower and middle reaches of the River and the enhancement of a fisheries nursery habitat in the River's upper reach. The key performance indicators are the re-establishment of viable oyster habitat and submerged aquatic vegetation to their respective target levels.

The Districts' IRL and St. Lucie River programs are closely coordinated with several agency management plans and programs. It's important that these programs coordinate with other agencies to ensure consistency in the management of seagrasses and other important estuarine resources, pollution controls (e.g., pollutant load reduction goals, non-point and point source controls), and coastal wetlands. Increasingly, it's becoming a budgetary necessity for the Districts and other governmental programs to share costs and labor associated with restoration monitoring, applied research, and management. Much of what has been accomplished in the past decade is due to the cooperation and efforts of many agencies -- local, regional, state, and federal.

And, much has been accomplished in addressing the issues, goals and objectives of the IRL SWIM Plan.

Our understanding of the relationship between water quality and seagrass has advanced considerably, and thus, the factors that probably do or do not control seagrass distribution in the IRL system. This understanding is an important pre-requisite for the development of final pollutant load reduction goals (or PLRGs). PLRGs[1] can be viewed as "design criteria" for projects or strategies whose purpose is the improvement of water quality or clarity, the major Lagoon-wide factor influencing seagrass coverage.
Even though final PLRGs are not recommended at this time, provisional water quality or pollutant load reduction targets have been established to enable the design of many non-point source projects to begin pollution abatement now rather than later. There has been significant achievement in the control of point sources with the removal of more than 28 billion gallons of discharge from domestic wastewater treatment plants during the 7-year period from 1993 to 2000. Nearly 56,000 acres of wetlands and uplands have been acquired for the purpose of constructing water quality remediation projects as well as for habitat preservation or rehabilitation. More than a half-million cubic yards of harmful muck sediment deposits were removed from tributary creeks and canals; a precursor of more, larger scale muck removal projects in the future.

So, as a result of all this work, is there any improvement in water quality or seagrass coverage? There has been measurable improvement, but it's difficult to ascertain whether the improvement is primarily a result of restoration efforts or a response to weather patterns or other natural events. There has been a net gain in seagrass coverage of nearly 4,000 acres from 1992 to 1999 (65,700 to 69,700 acres, respectively). The greatest gains in seagrass acreage are in areas that had experienced the greatest losses since1943. It's possible that the long drought in the late1990s may have been largely responsible for this positive trend; nonetheless, the cumulative effect of restoration work now and in the future should help to maintain this trend.

[1] It is presumed by Florida Department of Environmental Protection that final recommended PLRGs may be heavily relied upon for the development of the EPA-mandated Total Maximum Daily Loads (TMDLs) as stipulated in the Florida Watershed Restoration Act (Chapter 403.067, F.S.).

The most tangible and immediate improvement in the IRL system is the hydrologic reconnection of more than 23,000 acres of impounded wetlands since 1989. Impoundment reconnections restore many of the estuarine functions provided by salt marsh and mangrove wetlands. Once they are reconnected, fisheries utilization of the wetlands increase essentially overnight, a more natural and diverse vegetative community and its associated fauna are given a chance to recover and usually do.

There has certainly been a noticeable increase in the public's awareness of the Lagoon's problems and its ecology, and the public's understanding of the projects -- federal through local -- that benefit the Lagoon's recovery and management. Public concern for maintaining a stable, productive human community with a good quality of life includes a healthy Lagoon system.

Much has been accomplished, but more work remains to be done to reach the targets established for seagrass and coastal wetland restoration. During the past decade, the greatest Lagoon-wide seagrass coverage documented or mapped was 69,700 acres in 1999. The ultimate or maximum target is coverage to 1.7 meters depth for much of the Lagoon, representing more than 118,000 acres of seagrass. With respect to the reconnection of impounded wetlands, the total acreage target is more than 37,000 acres. Currently, the reconnected acreage stands at about 28,000; a major advance toward the target. However, the remaining 9,000 acres is proving to be a much greater challenge to reconnect.

Based on the monitoring and diagnostic work to date, it is clear that future work on water quality and seagrass should be focused on non-point (stormwater) source controls. In particular, most of the effort will be directed at large-scale, watershed projects designed to annually reduce thousands to millions of pounds of key pollutants affecting water clarity and billions of gallons of freshwater discharges where it is determined to be excessive and detrimental to salinity regimes. These proposed watershed projects are located in the Central and South IRL and in the St. Lucie River watershed. Those are the areas in the IRL system where water quality and seagrasses (and oyster habitat in the case of St. Lucie River) have suffered most from such impacts, and the land requirements for these large projects can generally be met.

It is also clear that in order to fully achieve the coastal wetland targets, especially in the North and Central IRL, land ownership and marsh management issues need to be resolved. The remaining privately owned impoundments are strategically important wetland habitats relative to their location in the Lagoon basin and are unique relative to the surrounding landscape. Public acquisition is a prerequisite to their rehabilitation. Furthermore, the proper management of all reconnected impoundments is critical to the diversity and health of the IRL system.

Descriptions and budgets of planned work over the next 5 years (2002/03 – 2006/07) are provided in some detail in the following chapters, and a summary of the same 5-year budgets is provided at the end of this Executive Summary (Tables A and B). Most of the planned work and projected annual budgets reflect the focus on priority needs mentioned above. Other important work is also planned and described. This is work that can accelerate, enhance, or ensure restoration success (e.g., muck removal and the evaluation of alternatives to enhance Lagoon flushing); continue our vigilance on the status of the Lagoon (e.g., water quality and seagrass monitoring); gauge the efficacy of

implemented projects (e.g., stormwater treatment and muck removal projects); diagnose other potential problems related to seagrass or wetland resources; and further educate and involve the public in the management of the estuary.

The plan for the next 5 years – the projects, and their schedules and budgets – is dependent on a relatively high level of federal, state, regional, and local cooperation, whether that cooperation is manifest as cost-share or as project collaboration collecting data or building structures. An example of interagency partnership programs that can produce significant improvement in the IRL are those that exist between the U.S. Army Corps of Engineers (USACE) and each of the Districts: the recently initiated IRL-North Feasibility Study (SJRWMD/USACE) and the recently completed IRL-South Feasibility Study (SFWMD/USACE). Both study programs have the potential of drawing down hundreds of millions of federal dollars to implement a variety of solutions (mostly structural) that are determined feasible and cost-effective in helping meet SWIM plan objectives, especially the watershed PLRGs and other restoration targets cited above. Both Districts view these USACE partnership programs as the new *flagships* of the IRL restoration effort over the next 5 years and beyond.

If the USACE/Districts partnerships are considered the *flagships*, then the cooperation and work performed by local governments is the *frontline*. Success of the IRL programs will continue to be highly dependent on local government involvement – by cities, counties, mosquito control districts, and water control districts. Their collective involvement is typically demonstrated in the large amount of labor and equipment expended each year assisting the Districts in water quality and seagrass monitoring, reconnection and management of impounded coastal wetlands, land acquisition and management support, construction and maintenance of drainage treatment and erosion control systems, public education, and in many other activities. Much of this work is in-kind service; that is, work that is taken on by local agencies and supported by their own budgets[2]. Participation by cities, counties, and water control districts will likely grow as they work to meet their responsibilities for achieving PLRGs and related resource targets, and wetland management targets.

[2] It is not possible to accurately represent local government in-kind support in monetary terms for presentation in this updated plan; however, it is safe to assume the each county in the IRL basin (inclusive of city and water control district jurisdictions) contributes several hundreds of thousands of dollars to about a million dollars per any given year toward projects related to IRL management.

Table A. Summary of Projected Budgets by Sub-Lagoon, Program, & Fiscal Year A more detailed budget is found in Chapter 8, Tables 8-1a through f.	**SJRWMD (SJ) and SFWMD (SF) Budget Estimates includes ad valorem, IRLNEP (EPA), license plate, and state-appropriated funds directed to the Districts** ***Fiscal Year***					
	FY 02	***FY 03***	***FY 04***	***FY 05***	***FY 06***	***FY 07***
Lagoon-wide	**Monitoring, Research & PLRG development, Land Acquisition, Planning, Education Projects**					
Seagrass & Water Quality	SJ: $3.627M SF: $972,000	SJ: $3.086M SF: $1.135M	SJ: $1.714M SF: $1.125M	SJ: $3.489M SF: $1.199M	SJ: $1.330M SF: $1.090M	SJ: $2.947M SF: $1.073M
Coastal Wetlands	SJ: $24,000 SF: $5,000	SJ: $29,000 SF: $ 6,000	SJ: $44,000 SF: $ 6,000	SJ: $38,000 SF: $ 6,000	SJ: $44,000 SF: $ 6,000	SJ: $50,000 SF: $ 5,000
Public Involvement & Education	SJ: $320,000 SF: $ 26,000	SJ: $580,000 SF: $ 30,000	SJ: $414,000 SF: $ 42,000	SJ: $414,000 SF: $ 29,000	SJ: $417,000 SF: $ 29,000	SJ: $417,000 SF: $ 42,000
Totals rounded to nearest $1,000	*SJ: $3.611M* *SF: $1.003M*	*SJ: $3.695M* *SF: $1.171M*	*SJ: $2.172M* *SF: $1.173M*	*SJ: $3.941M* *SF: $1.234M*	*SJ: $1.791M* *SF: $1.125M*	*SJ: $3.414M* *SF: $1.120M*
Districts/IRLNEP Planning & Administration	*SJ: $165,000* *SF: $ 92,594*	*SJ: $165,000* *SF: $ 23,216*	*SJ: $165,000* *SF: $50,000*	*SJ: $165,000* *SF: $ 99,750*	*SJ: $165,000* *SF: $ 42,000*	*SJ: $165,000* *SF: $ 32,000*
Mosquito Lagoon	**Model application, PLRG development, Research, Non-Point Source and Wetland Projects**					
Seagrass & Water Quality	SJ: $186,400	SJ: $278,050	SJ: $250,600	SJ: $264,850	SJ: $251,100	SJ: $151,100
Coastal Wetlands*	SJ: $209,350	SJ: $159,350	SJ: $262,100	SJ: $212,100	SJ: $362,100	SJ: $312,100
Totals rounded to nearest $1,000	*$396,000*	*$437,000*	*$513,000*	*$477,000*	*$613,200*	*$463,200*
Banana River Lagoon	**Model application, PLRG development, Research, Non-Point Source and Wetland Projects**					
Seagrass & Water Quality	SJ: $258,800	SJ: $158,800	SJ: $480,250	SJ: $291,251	SJ: $333,000	SJ: $1.791M
Coastal Wetlands	SJ: $ 6,050	SJ: $ 6,050	SJ: $ 36,050	SJ: $106,050	SJ: $ 56,050	SJ: $106,050
Totals rounded to nearest $1,000	$265,000	$165,000	$516,000	$397,000	$389,000	$1.879M
North & Central IRL*	**Model application, PLRG development, Research, Non-Point Source and Wetland Projects**					
Seagrass & Water Quality	SJ: $6.659M	SJ: $4.902M	SJ: $5.878M	SJ: $5.448M	SJ: $7.723M	SJ: $6.209M
Coastal Wetlands	SJ: $124,150	SJ: $473,650	SJ: $235,400	SJ: $110,400	SJ: $221,400	SJ: $110,400
Totals rounded to nearest $1,000	$6.783M	$5.376M	$6.113M	$5.558M	$7.944M	$6.319M
South IRL	**Model application, PLRG development, Research, Non-Point Source and Wetland Projects**					
Seagrass & Water Quality	SF: $737,650	SF: $550,949	SF: $2.605M	SF: $2.605M	SF: $2.965M	SF: $2.640M
Coastal Wetlands	SF: $262,541	SF: $257,700	SF: $257,700	SF: $232,700	SF: $207,700	SF: $182,700
Totals rounded to nearest $1,000	*$1.000M*	*$809,000*	*$2.863M*	*$2.838M*	*$3.173M*	*$2.823M*
St. Lucie River*	**Model application, PLRG development, Research, Non-Point Source and Wetland Projects**					
Water Quality & Biological Resources	SF: $22.18M	SF: $445.07M	SF: $167.47M	SF: $147.20M	SF: $58.87M	SF: $17.62M
Shoreline & Floodplain Restoration	SF: $0	SF: $70,000	SF: $70,000	SF: $70,000	SF: $105,000	SF: $115,000
Totals rounded to nearest $1,000	*$22.18M*	*$445.14M*	*$167.54M*	*$147.27M*	*$58.98M*	*$17.74M*

* Most or all the funding from either the SJRWMD or SFWMD for these projects is counted as cost- share by the USACE in the IRL-North and IRL-South Feasibility Study programs, respectively. USACE's costs are shown in Table B.

Table B. Other Major Programs Benefiting the IRL System

A more detailed budget is found in Chapter 8, Table 8-2.

- **U.S. Army Corps of Engineers (USACE): Feasibility Studies & Project Implementation**
- ***Blueway* Land Acquisition Program (estimated land purchase costs only)**
- **St. Lucie River Issues Team**

	Fiscal Year					
	FY 02	***FY 03***	***FY 04***	***FY 05***	***FY 06***	***FY 07***
IRL- NORTH Feasibility Study; USACE costs only *IRL-North F.S. Project Management Plan, 6-17-02)****	*$81,300*	*$1.550M*	*$1.354M*	*$430,000*	*$302,000*	*$212,000*
IRL-SOUTH Feasibility Study & Project Implementation **USACE costs only** (based on IRL-South F.S. Report)*	*$3.300M*	*$6.636M*	*$23.872M*	*$40.867M*	*$89.255M*	*$92.218M*
BLUEWAY Land Acquisition (Phase I) – Approximate Land Purchase Costs* up to 7,705 acres in Mosquito Lagoon, Banana R. Lagoon, N. and Central IRL	*$0*	*$4M*	*$5M*	*$5M*	*$5M*	*$10M*
St. LUCIE RIVER Issues Team Legislative appropriations only	*$4M*	*$5M*	*$5M*	*$5M*	*$5M*	*$5M*

* The IRL-North and IRL-South programs are funded 50/50 by the USACE and the Districts (as the local sponsors). The budgets shown above are the estimated USACE costs only. The Districts' match is represented in the preceding table as indicated by asterisks.

** The total 1998 assessed value of the 8,857 acres of land targeted for Phase I of *Blueway* acquisition is ~$60,000,000. Funds would be derived from individual county land acquisition programs (especially in the case of South IRL – St. Lucie and Martin counties), and from the state's Florida Forever program, FDOT mitigation bank, and the Districts' Save Our Rivers program.